

US009638380B2

(12) United States Patent Kramer et al.

(10) Patent No.:

US 9,638,380 B2

(45) Date of Patent:

May 2, 2017

(54) BENDABLE LED STRIP

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(*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/226,877

(22) Filed: Mar. 27, 2014

(65) **Prior Publication Data**

US 2017/0030536 A1 Feb. 2, 2017

(30) Foreign Application Priority Data

Mar. 27, 2013 (DE) 10 2013 005 230

(51)	Int. Cl.	
	F21S 4/22	(2016.01)
	F21V 23/06	(2006.01)
	H01R 4/24	(2006.01)
	H01R 13/52	(2006.01)
	F21Y 115/10	(2016.01)

(52) **U.S. Cl.**

(58) Field of Classification Search

CPC F21S 4/22; F21V 23/06; H01R 13/5205; H01R 4/2404

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

12/1998	Gustafson	
9/2000	Mistopoulos et al.	
1 3/2005	Hutchins	
1 1/2007	Mrakovich et al.	
1 8/2002	Marcus	
1 10/2005	Sloan et al.	
(Continued)		
	9/2000 1 3/2005 1 1/2007 1 8/2002 1 10/2005	

FOREIGN PATENT DOCUMENTS

DE	102008004238 A1	7/2009
DE	202009013278 U	10/2010
WO	2012062191 A1	5/2012

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(57) ABSTRACT

The invention relates to a flexible LED strip, comprising modules that include light-emitting diodes (3) arranged successively at intervals, in particular equal intervals longitudinally, wherein the light-emitting diodes (3) of each module are electrically interconnected on one circuit board (2) each, in particular together with other electronic modules (4), and the LED strip can be severed between the modules, in particular without destroying the electrical functionality of the modules, wherein each module has at least one contact region at which a power supply can be connected to the module and all circuit-board sections (2) are mounted in a flexible enclosure (1), wherein the at least one contact region of each module extends through the enclosure (1) and can be electrically contacted outside the enclosure (1). The invention furthermore relates to an end piece (7), a coupling piece (8), and a connector piece for power-supply lines (6) or control-signal lines (6) of this LED strip.

21 Claims, 7 Drawing Sheets

